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Learning Styles as a Fundamental Improvement Factor of Learning Quality

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Abstract:

This study made a fundamental consent: that all learning and teaching styles are key factors in setting up programs that will advance the quality of the learning process. In this context, the aim of this study was to establish the basic principles, concepts, criteria and specifications of learning quality based on Kolb's model of learning styles, which , it has been assumed, not only has a diagnostic application, but it also has a practical utility. The proposed approach to the improvement of the quality of the learning process, having considered all learning styles of those educated (i.e. all learners), sought to compile an individualized learning method through a clear acknowledgment of the goals and the results of learning in the frame of a holistic approach; this approach combines the goals, the context, the methodology, the evaluation and the progress of those educated.

Key Words: *Learning styles, improvement of learning quality, quality learning framework*

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1. Introduction

At the centre of many researchers' interest we find the planning and application of techniques and approaches for the improvement of the quality of learning; many research studies have been conducted in this area from a variety of perspectives. For instance, in many methodological research studies it is argued that when it comes to the most valuable type of knowledge, we should shift our interest from the hitherto predominant 'declarative' knowledge, which refers to the content, the 'what' of knowledge, to the so-called 'procedural' knowledge, which refers to the 'how' of teaching and learning. At the same time, it is noted that all learning styles should be considered, yet no study probes deeply into this matter or gives a detailed account of the different styles. In effect, research studies that take learning styles into consideration before planning and applying methodologies and approaches for the improvement of the learning process do not exist. It is this gap that the present study wishes to fill.

In the relevant literature discussing the improvement of the learning process through exploitation of learning styles, we find the following:

- Qualitative learning consists of the amalgamation of thinking types and metacognitive approaches and values (Glatthorn and Baron, 1991)
- Individual learning styles determine the learning outcome to a great degree and may constitute a significant factor in the effectiveness of learning (Rogers, 1999; Terrell, 2005)
- Individuals vary greatly in the way they develop the learning styles they adopt in the acquisition of new knowledge (Robertson, 1985)
- The more learning styles one takes advantage of in the learning process, the richer the learning experience (Claxton and Murrell, 1987)
- Student learning styles could be used as a complete framework for planning of teaching and learning activities as well as a guideline for the understanding of learning difficulties, for career counselling and, finally, for counselling (Tennant, 1988)
- Understanding learning styles aids students, on the one hand, to understand their weaknesses and, on the other hand, to realize their potential; it may also benefit the teacher since it allows him/her to cover the syllabus in such ways that accommodate for variation within one class (Kelly, 1997)

Bearing the above in mind, but also that: a. a school's aim is to primarily satisfy the emotional and intellectual needs as well as the particular interests of the students, to contribute to the development of skills and personal choices in the students and to guarantee equal opportunities and learning possibilities to all students; b. learners differ significantly in the way they develop the learning styles they adopt while

acquiring new knowledge; and c. the acceptance of learning as an individual and subjective procedure and, thus, as a significant factor in the improvement of its quality, it becomes obvious that taking advantage of learning styles in order to maximize the effectiveness and quality of learning is a pressing need.

The present study aims at investigating such a research problem and studying the prerequisites as well as the outcomes of exploiting learning styles in order to improve the quality of learning. Within this framework, this study aims at determining the conditions required for the development of educational programs. This is attempted through the investigation of ways that respond to the learning needs, the interests as well as the learning abilities of a variety of learner types so that the highest possible quality of procedures as well as of learning outcomes may be guaranteed.

The basic hypothesis of this study is that cognitive, learning and teaching styles constitute the significant factors for the planning and the execution of methodologies and approaches to the improvement of the quality of the learning process. The particular hypotheses which the present study will attempt to answer are:

1. The humanization and individualization of the learning process constitute fundamental pedagogical principles for the quality of learning.
2. Kolb's model of learning abilities can constitute a framework for the planning, execution and evaluation of the learning process, which will guarantee the satisfaction of learners' learning needs for all categories in the model.
3. The more learning styles are exploited during the learning process, the more the effectiveness and quality of learning are maximized.
4. Learners' learning styles are directly related to the quality of their learning.
5. The factor "ability for learning" is related to the needs, the preferences, the motives and expectations of the learners.
6. Promoting the aim of equal opportunities to education is related to the acceptance and recognition of the variety of abilities learners have for learning.

The method we shall use is the comparative paradigm through the meta-analysis of discourse and of research results, as these are found in the international literature. In reviewing the literature that concerns the framing of principles, criteria and prerequisites for the quality of learning, we took into consideration the relatedness between learning styles and individuals' quality of learning. This study presents a detailed recording of the elements, the characteristics and the criteria for the quality of learning and incorporates the various learning ability types in an overall notional framework that constitutes an approach to the quality of learning. Then the consequences of such a classification are examined as well as theories that explain

how the characteristics of individual learning may be related to the quality of the knowledge offered in the framework of the educational process. Finally, using the comparative paradigm we reflect on the consequences of such an approach on Greek reality are examined.

2. The Central Role of Learning in the Quality of the Educational Product

The fast-paced developments in sciences and technology greatly affect the particular structural elements in education. Knowledge is enhanced, but at the same time rapidly devalued. The society of knowledge constitutes a predominant demand and aim of our times and is accepted as the new, potentially privileged field of action and competition internationally.

It, therefore, becomes obvious that learning plays a crucial role within an educational organization, while its development and successful management must be a conscious strategic choice. Within a conceptual framework for the development and guarantee of the quality of learning, the learning process constitutes its most important parameter. The focal point in a modern learning organization is not what the organization or its people know (i.e., the product of learning), but how the organization and its people learn (i.e., the learning process) (McGill *et al*., 1992). As in today's world this process becomes all the more crucial for the quality of the educational product, its successful management carries significant weight.

Furthermore, many researchers have pointed out that in our times, when educational organizations are called upon to achieve more with less means, these highly regarded goals may be accomplished by promoting learning as their primary enterprise (Sallis and Hingley, 1992; Miller and Inniss, 1992; FEFC, 1994; 1996; NACCB, 1993). Naturally, because learners vary and they learn better with methods that take their aptitudes, interests and needs into account, a quality educational organization must study both methods and needs so as to develop strategies catering for individualized and differentiated learning (Sallis, 1994).

Finally, the learning process constitutes a primary notion and is of vital importance in determining the quality of education since it defines the main reason for the existence and function of education. The quality of this process is closely interrelated and directly affected by other equally significant parameters in the quality of education such as leadership, human and material resources. Nonetheless, the learning process determines the dynamic and formative relationship between those involved in education, thus formulating practices that could either enhance or impinge upon its effectiveness.

3. Theoretical Framework

Promoting learning is the main goal for all educational systems at all educational levels. Learning, which is the goal of all teaching, has become the object of study for many researchers from the field of psychology, pedagogy but also other scientific fields. Many learning theories have been proposed and supported at various times and an equal number of research studies have attempted to explain the process by which individuals learn. Despite the multitude of studies, learning remains a complex, multidimensional process, happening at different levels. Therefore, the answers to the questions of 'what is learning?' and 'how does it happen?' are many and diverse precisely because learning is a process that has not been completely deciphered yet and, as a result, researchers do not agree on one cognitive definition of it.

According to one view, learning is defined as a process that assists institutions to modify or change their behaviour in a fairly short period of time and in a fairly permanent way so that in a new, yet similar situation they will not have to undergo the same change or modification (Gangé, 1985). At the same time, according to Kolb, learning is defined as a process by which knowledge is created through the transformation of experience, is constantly recreated and is not an independent entity that has to be acquired and transferred (Kolb, 1984). Furthermore, it is argued that an individual learns, i.e. adopts a new behaviour or modifies his/her existing behaviour by observing that of other people as well as the consequences it has (Bandura, 1991). From another perspective, learning today is seen more as a dynamic and multidimensional process which results from the coordinated action and interaction between: (a) the intrapersonal-individual factors of the student, (b) the learning framework and (c) the learning material that must be acquired (Simons and Duffy, 2000).

From the definitions above, we conclude that the learning process may be defined as a series of internal cognitive functions that transform the initial stimulus to successive stages of data elaboration, aiming at developing certain abilities which are evinced in specific actions or activities. The teaching process specifically targets these internal cognitive functions or stages of learning, in an effort to effectively influence them.

3.1 A Conceptual Approach to the Quality of Learning

The lack of a commonly accepted cognitive definition for learning complicates the attempt to define the quality of learning. In particular, the difficulties defining the quality of learning relate to:

- Identifying the real product of learning and defining the demands, expectations and satisfaction of the subjects of the educational process
- Precisely delineating the learning goals
- Measuring and controlling those processes related to teaching and learning
- Investigating and defining the role students play in their own learning
- Risking, on the one hand, an overestimation of those learning factors that are measurable in quantitative terms and, on the other hand, an underestimation of other significant yet qualitative dimensions of learning that are hard to measure and describe in quantitative terms

Despite the aforementioned difficulties, in an effort to cognitively define the term "quality of learning" we must mention the following: (a) it is difficult to cognitively define quality in an educational context due to the diverse opinions related to the aims, goals, social and political function of education (Doukas, 1999); (b) the definitions of the quality of education that have been attempted from time to time, differ and reflect a variety of approaches to the individual and society. The most widespread theory defines quality in education on the basis of its human-making dimension and effectiveness. According to this approach, education is defined as quality education if it contributes to the intellectual cultivation of the individual, his/her moral uplift and the development of the whole person and his/her integrity (Matthaiou, 2000). According to other theories, quality in education is a relative matter, determined by many factors; these consist of the inflow quality (curriculum, funding and human resources), the procedures and function of schools and finally, the output-results (e.g., student achievement records) (Vroeijenstijn, 1995). Other researchers point out that the model of analysis for quality should be what happens in the school, instead of an analysis model suitable for production units, i.e. the measurement of the relation between output-results of the educational system (Jansen, 1995).

Even though in the above outlining of quality theories it becomes obvious that there is no consensus between researchers regarding the cognitive definition of quality in education, nonetheless, a common language seems to emerge as the term is discussed within the framework of the educational community. Additionally, an agreement is achieved on some basic principles in this debate. These basic principles form the typical characteristics of a quality school and are viewed as objectives (Aspin and Chapman, 1997; Darra, 2002). The most important of these principles relate to the role of the school:

- To offer equal opportunities and possibilities for the acquisition of knowledge, abilities, skills and behaviours that will prepare students to live in today's complex society

- To encourage critical thinking and to promote the value of achievement and high aspirations in individuals and educational organizations, as well as success in all areas of activity
- To be democratic and just and to offer their students the opportunity to acquire those values that will guarantee their personal and social development
- To connect education for personal autonomy to education for contribution to society and to prepare students for their involvement in the cultural and economic development of society (Chapman and Aspin, 1997)

Based on the above definition of the role of the quality school, we shall attempt firstly, to define the core characteristics-criteria of quality in learning and secondly, to provide an extensive definition of the term quality learning.

Table 1: Differentiating Between Learning and Quality Learning

Areas	**Learning**	**Quality Learning**
General Characteristics	Skills acquisition related to knowledge of notions, generalizations, pieces of information, rules ad principles that constitute the matter of science	Skills acquisition of procedural knowledge related to how to use knowledge and objects that constitute the matter of technology
Goals	Acquisition of academic knowledge of an informative nature	Acquisition of knowledge that forms part of a relationships framework rather than a framework of pieces of information
Learning Process	Priority to the teaching of academic knowledge to the detriment of other equally important aims	Application in real-life situations of skills and processes that have been taught recently on previous occasions. Social Skills, attitudes and values
Teaching Strategies	Presentation of knowledge as a given and not as the object of inquiry Strategies of direct teaching in the form of information teaching	Strategies that involve procedures of interrelation, organization and data processing Exploitation of diagrams, analyses, revisions
Student's Role	Passive memorization of fragmented and inert knowledge	The student has the capacity through systematic observation and imitative repetition to acquire procedural skills
Skills	Skills acquisition for: Informative Learning Organizational learning for Creation of Notions Analytical learning concerning Formulation of Generalization Practical learning concerning problem-solving	The acquisition of skills and strategies of investigation which lead to autonomous learning Transformation of the information Continuous self improvement

To select the criteria we propose, we used the following sources:

- Former goal classifications such as those by Bloom (1956); Gangé (1967; 1968); Massiala (1986), which make reference to the cognitive, emotional, psychokinetic and participatory field.
- The "discourse on the most valuable knowledge" (Kazamias, 1960), the structure and classification of school knowledge (Young, 1971; Schwab, 1970).
- The analyses of the structural elements of critical thinking (Matsagouras, 2006), as well as programmes for critical thinking (Pace, 1991; Quellmalz, 1991; Adams and Hamn, 1994; Halpern, 1999).
- The most important classifications of cognitive skills (Ennis, 1987; Sternberg, 1987; Presseisen, 1991; Halpern, 1996; 1999; Matsagouras, 2006).
- Analyses of the definition, classification and goal of metacognitive skills (Matsagouras, 2006).

The study of the above sources leads to the conclusion that what we call quality or effective thinking and learning is an amalgamation of forms of thinking and metacognitive attitudes and values (Glatthorn and Baron, 1991). Table 1 presents a detailed presentation of these elements, characteristics and criteria of learning quality.

Furthermore, in relation to the improvement of quality in learning, Seymour points to the need to emphasise those processes that relate to learning and the need to adopt a strategy of constant improvement applying the circle Plan-Do-Check-Act (PDCA) (Seymour, 1992). The same researcher defines the following stages in a PDCA circle for the improvement of the learning process:

- The development of courses that satisfy the educational needs of the students (Plan).
- The teaching of the courses (Do).
- The evaluation of the way students uses learning as well as the checking of their opinions in relation to the way they learn (Check).
- The modification of the learning process in accordance to the results of the evaluation (Act) (Owlia and Aspinwall, 1997).

Also, Hittman (1993) argues that with regard to knowledge, the following variations exist in the sources of differentiation of the learning process:

- Students' different experiences;
- Students' varying abilities for learning;
- Teaching methods that are combined at random during the learning process.

The same theorist argues that the causes of this differentiation and their combined impact on the quality of learning must be defined and analyzed so as to minimize major deviations. Underlining the importance of statistics as a notion in the improvement of the quality of learning in educational organizations, he claims that distinguishing between the common variability factors found within the system and those special factors attributed to individuals is crucial in the investigation of student achievement (Hittman, 1993).

Within the above-mentioned framework for the quality of learning, we could argue that the role of education providers is to encourage students to participate in the learning process in such a way that they themselves take charge of creating, providing as well as appreciating the results of learning (Muller and Funnell, 1992). Therefore, students should be at the centre of the learning process as well as of the evaluation process of the quality of learning. Besides student feedback constitutes a significant aspect of the evaluation process of the quality of learning.

However, placing students at the centre of the learning process is also linked with the aim of empowering as well as enhancing them. Empowering and enhancing students is related with a bestowal of relative autonomy, power and responsibility on them. In particular, empowering students is related with two matters. Firstly, it allows them to partake in the decision-making about their learning, since according to Muller and Funnell (1992), "to a certain degree, the student must participate in the learning process and take responsibility for the definition and process of learning". Secondly, enhancing students strengthens their self-confidence, perceptiveness and critical judgment. Within this approach of enhancement, learning is appraised with relation to how much the educational system alters a student's comprehension ability and self-awareness. Therefore, the quality of learning is assessed against the democratization of the learning process and not just against the outcomes of learning (Harvey and Green, 1993). Therefore, humanization and individualization of the learning process constitute basic pedagogical principles in the quality of learning since it is through these that the democratization of education and hence, society is accomplished.

Finally, this conceptual approach towards the quality of learning emphasizes democratic learning processes and aims, on the one hand, at the development of a whole, autonomous learner and, on the other hand, at education's ability to strengthen democracy.

4. Cognitive and Learning Styles

Studying the literature on cognitive and learning styles reveals a great discrepancy among the definitions of terms. According to one view, learning styles are seen within a general framework that consists of four areas intricately related: the

cognitive, emotional, natural and behavioural area. This type of learning style is often called cognitive style and subsumes the preferred types of cognitive functions (Oxford *et al*., 1992). At the same time, learning styles are argued to constitute the general models that guide students in the learning process, i.e., the general approach adopted by students in order to acquire new knowledge or solve a problem (Oxford *et al*., 1992). Additionally, it is argued that a cognitive style consists of the characteristics and the constant approach one takes in organizing and analyzing information (Tennant, 1988). A similar approach defines cognitive styles as the absolutely constant, unchangeable characteristics of an individual (Riding *et al*., 1993).

Naturally, in most cases cognitive and learning styles are used interchangeably (Spanaka, 2007). Generally speaking, cognitive styles are viewed as the nucleus of the learning styles which, in part, form a genetically predetermined and penetrating mode of processing information and situations (Rayner, 2000; Dornyei, 2005). From the definitions above, it is concluded that cognitive-learning styles refer to the distinct way, the permanent and characteristic inclination by which individuals perceive, recall, organize, process information, think about and solve problems or engage in decision-making. Indicatively, we mention the following differentiations: global-analytical, logical-intuitive, meditative-impulsive, dependent-independent of the field (Mouti, 2008).

5. Kolb's Model on Learning Styles

Many researchers attempted to describe the whole learning process as the basis for the recognition of the various learning styles. However, the theory that has attracted most attention in the literature is that of Kolb (1976; 1984). His model incorporates the two bipolar dimensions of perception development as described by numerous psychologists and which are the active-reflective dimension and the abstract-concrete dimension (Allinson and Hayes, 1988). The first ranges from direct participation to detached observation. The second ranges from dealing with tangible objects to dealing with theoretical concepts. Kolb uses these polar extremes to define a four-stage cycle of learning (Fig. 1).

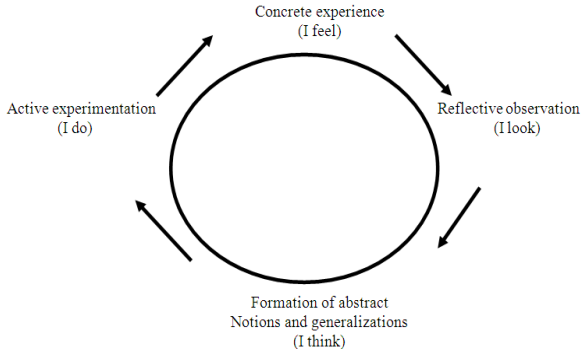


Fig. 1: Kolb's cycle of learning

Based on the model above, Kolb further argues that through the theory of empirical learning a holistic approach of learning, combining experience, perception, knowledge and behaviour, emerges (Kolb, 1984). Also, according to Kolb, in order for an individual's learning to be effective, four different types of skills are required; skills that relate to concrete experience, reflective observation, abstract conceptualization and active experimentation. Each stage of the cycle presupposes the use of different skills and the student is called upon to choose the appropriate ones. It is also argued that most individuals tend to be stronger in certain areas and are, therefore, inclined towards a certain learning style (Allinson and Hayes, 1988).

In an effort to categories these styles, Kolb created the Learning Style Inventory which consists of twelve questions describing possible learning styles and which refer to the fours modes of the learning process (Kolb, 1984; 1993). In accordance with these four modes, Kolb developed four respective basic learning styles: the active, the meditative, the abstract and the experimental. Their major characteristics are (Kolb, 1993; Spanaka, 2007):

Active style: This learning style relies on the predominant learning abilities of active experimentation (I do) and abstract conceptualization (I think). Individuals of this learning style have great abilities in decision-making, problem-solving and the practical application of abstract ideas.

Meditative style: This learning type relies primarily on concrete experience (I feel) and reflective observation (I look). These individuals adopt attitudes through observation rather than action.

Abstract style: This learning style relies on abstract cognition (I think) and reflective observation (I look). This style has many advantages when it comes to inductive reasoning and the creation of abstract models while individuals of this style focus more on the logical correctness of ideas than on their practical value.

Experimental style: This learning type relies mainly on active experimentation (I do) and concrete experience (I feel); individuals of this type often seek new opportunities for action.

Many objections have been risen at various times (Rogers and Freiberg, 1994; Herron, 1992) with regard to the scientific validity and effectiveness of Kolb's theories. However, it is not within the aims of this study to analyze neither the psychological mechanisms of learning styles nor their neuro-psychological validity; rather we aim at approaching learning styles as general models of information processing and learning behaviours that significantly influence the outcome of learning. Therefore, we may argue that Kolb's theory has made a significant contribution to the research of learning, of development and generally, of education.

6. Using Learning Styles in the Teaching Practice

In order to accomplish the teaching goals set for each subject area, teaching methodology must contribute with means and processes that simultaneously promote higher goals of school education. In order however, for the methodological choices to be pedagogically acceptable but also effective in practice, they must be governed by specific principles and tenets, the most important of which are:

- Learning constitutes a cognitive procedure of exceptional complexity, its outcomes seen in terms of content knowledge, skills, attitudes, values and behaviours.
- In order to advance from one cognitive level to a higher one, students who are different and who have different learning abilities must be given opportunities through suitable stimuli, activities and means to question and judge what they have already learnt and to comprehend or even predict what is to follow in the teaching process.
- Teaching and learning should be a pleasant process for the students and should, therefore, take place within a framework that accepts their abilities, encourages them and promotes active participation and experimentation during the process of new knowledge acquisition.
- Learning and development depend on social factors and are more effective when teamwork strategies are employed in teaching. The dynamics that emerge in a student working group can be exploited either as a framework for processing information as a team or as a support framework which will lead to individual learning. Teaching styles that involve group work are recommended for project work, which in turn lend themselves to activities of an interdisciplinary nature, while at the same time make use of and encourage the various abilities of students.

- The interdisciplinary and holistic approaches to knowledge are necessary for the development of the ability of students to examine everyday matters more effectively.
- The application of interdisciplinary approaches restricts cognition-centered teaching and takes advantage of the variety of learning abilities found in students. Within this framework, the teacher becomes the mediator in independent learning, which students develop through their active participation in appropriate activities.

The principles and tenets mentioned refer to the teaching activities that are recommended and, especially, define the way a subject should be taught so that differentiated learning styles are taken into consideration and so that the goals set can be achieved. Furthermore, the recommended teaching strategies can be applied separately or combined depending on the circumstances, on the teaching unit, the different learning abilities of the students, the school conditions and the means available to the teacher.

6.1 Proposing an Application

As was mentioned above, one of the goals of education is to contribute to ability development in students, both in ways they prefer the most but also in ways they prefer the least. Kolb's model of learning abilities classifies these ways and can constitute a framework for teacher planning that covers a wide range, ensuring that the students' learning needs in every category of the model are covered (Spanaka, 2007). Within this framework and based on the differentiated learning types of abilities that Kolb has suggested, we propose the following model that takes advantage of all learning styles in the teaching practice and aims at the improvement of the quality of the learning process.

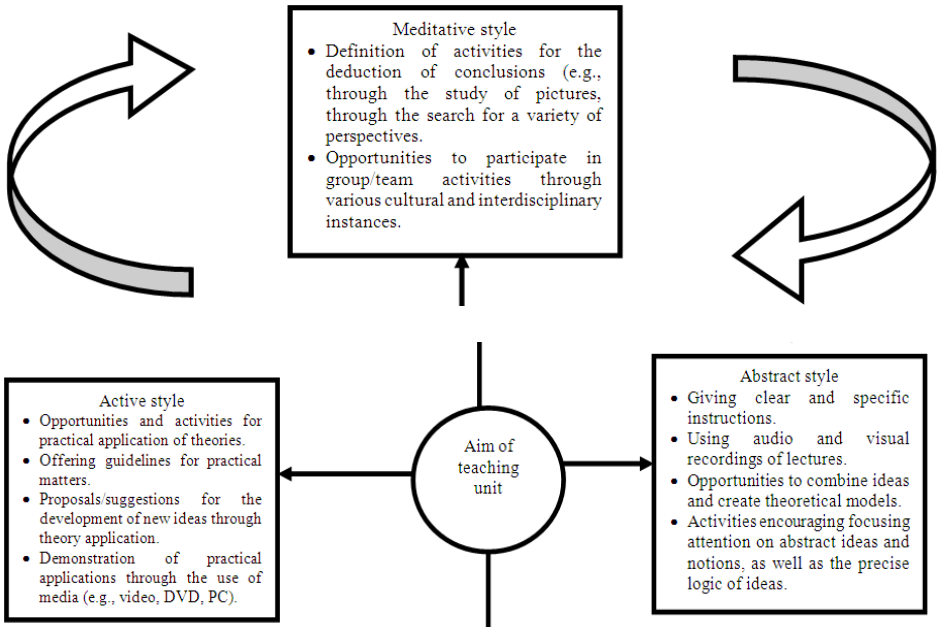
According to Fig. 2, Kolb's model of learning types provides a field of action for every student to develop his/her abilities and skills to the greatest degree and one in which all students can be incorporated. From the proposed model one can see that the incorporation of the cycle of learning abilities in the planning of teaching can be made by drawing a circle, at the centre of which the teaching aim is placed. Each line that radiates from the circle stands for a distinct learning type. The box at the end of each line proposes possible activities and ways by which a particular unit can be taught given the learning type each line represents. In conclusion, we may argue that the proposed model which draws teaching "around the circle", allows both students and teachers to partake in more effective, quality learning since it is multidimensional, multiform and interactive.

6.2 Prerequisites for the Effective Application and Exploitation of Learning Styles

The prerequisites concern the Greek educational reality and focus on two levels: the macro-level of educational policy and the micro-level of the classroom. On a macro-level, prerequisites are dependent on the overall educational policy and the administrative directives that are put into force so that an educational innovation, in this case that of the exploitation of learning styles in the teaching process, can be applied. On the micro-level of the school unit, prerequisites are dependent on the educational executives, the school leaders but also the teachers who will be called upon to put into practice and take advantage of the specific methodological teaching approach in their classroom:

On the macro-level of educational policy the promotion of decentralizing and delegating procedures is vital so as to:

- Promote a relative autonomy in the school unit



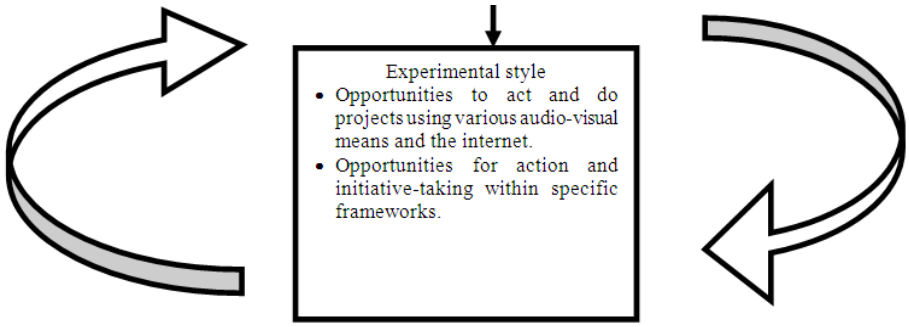


Figure 2: Taking advantage of learning types in the teaching process

- Free the educational system from its exam-oriented character and the from rationalization of teaching material.
- Ensure the systematic in-service training of teachers to make and manage educational choices and to apply alternative teaching approaches that take advantage of the various learning styles in the teaching process.
- Ensure the appropriate materials and infrastructure (appropriate space, school libraries and supplies).

On the micro-level of the school unit the necessary prerequisites are:

- To take advantage of the learning style inventory of the four learning styles created by Kolb (1974) so as to determine student orientation with regard to learning. (Kolb, 1993).
- To inform, support and guide teachers with regard to how to use pedagogically audio-visual means, information technology and communications available at schools so as to choose, incorporate and take advantage of the supportive educational software in the educational process.
- To create digital learning tools (texts, graphics, sound and animation) and such learning environments that can be adapted to the needs and the capacities of the students.
- To inform, support and guide teachers with regard to the right choice and the effective application of such innovative programmes as are the optional educational programmes (e.g., programmes for intercultural education, environmental education programmes and health education programmes).
- To support the effort for a wide application of projects, which it is argued, form the natural, social and methodological framework for the application of interdisciplinary approaches to knowledge. Between interdisciplinary education and the exploitation of learning styles there is a correlation. This is due to the fact that projects allow for a wider approach of the subjects, presuppose the use of group-work teaching and learning strategies and

activate learning procedures of students with different learning styles. Furthermore, they contribute to the cultivation of learner communication, a team-working spirit among students and to their familiarization with common problems; goals to be achieved through the use of specific practices and procedures that activate and engage in the teaching process different learning styles.

To create information networks in cooperation with the local educational authorities and local centres of pedagogical support for the teachers who apply such alternative teaching approaches and methodologies that take advantage of learning styles in the teaching process; these centres will also be equipped with a lending library, with an archive of educational material in digital and printed form.

7. Results

The most important outcomes of the exploitation of learning styles as a significant factor of the improvement of learning are:

- The maximizing of the quality of learning through the development of learners' abilities in ways that they prefer as well as ways they have little preference for.

- Securing such basic pedagogical principles of the quality of learning as the humanization and individualization of the learning process.

- The maximum exploitation of learners' varying abilities for learning restricts the knowledge-centred approach to teaching and promotes quality learning.

- Learning styles constitute general models of information processing and of learning behaviours that greatly influence the quality of the learning outcome.

- Kolb's model of learning abilities classifies the various ways individuals learn and may form a framework for a teaching plan with the desired breadth, securing thus that the learning needs of all learners in every category are satisfied.

- The model of learning abilities may also serve as a significant success factor for the design and execution of programs for in-service learning and employee training, as well as for the creation of programs for executive development.

8. Discussion

The aim of the present study is to define the prerequisites for the development of programs of planning, execution and evaluation of the learning process, through the investigation of ways that respond to the learning needs, the interests, the motives, the expectations, as well as the learning abilities of a variety of learner types so that the highest possible quality of procedures as well as of learning outcomes may be guaranteed. The overall study of the individual findings leads to the following conclusions with regard to the exploitation of various learning abilities in order to secure quality of learning.

With respect to the contribution of learning ability types to securing basic pedagogical principles in the quality of learning, it may be argued that this is linked primarily to the democratization of the learning process and not only in so far as the outcomes are concerned (Harvey and Green, 1993). This is due to the fact that it contributes to the humanization and individualization of the learning process by accepting as a core characteristic of learning its individual and subjective process. This outcome that confirms our first research hypothesis, and which is reinforced by data in the relevant literature (West – Burnham, 1997), means that all those who claim to be concerned with the improvement of the quality of learning, should focus their attention on the management of those factors that influence learning in individuals with different learning styles. These factors might refer to all stages of the teaching process (planning, organizing, executing and evaluating) and may include activities that relate to the content, the methodology, the teaching tools and the evaluation procedures.

Of special interest, too, is the finding that concerns the promotion of the goal of quality learning for all students since, according to Edmonds (1979), "everyone can learn"; what is necessary is to be shown "how". This finding, which confirms our second research hypothesis, may be attributed to the fact that an individual's personality is primarily structured by cognitive elements, experiences, happenings, and values that compose a unified whole. In particular, it is made up of different kind of skills that constitute skills of experience, of reflective observation, of abstract conceptualization, and of active experimentation (Kolb, 1984, 1993). Therefore, the adoption of the basic pedagogical principle: "everyone learns but in their own way" seems to constitute the dominant strategic choice of a contemporary quality learning organization.

With regard to maximizing the effectiveness and the quality of learning through the exploitation of the entire spectrum of learning ability types, it may be argued that it is connected to the realization of the learning process in a framework that accepts the abilities of different learners, a framework of active participation and of experimentation during the process of new knowledge acquisition. This result, which

confirms our third research hypothesis, means that in the process of planning, developing, executing and evaluating teaching, the focus should not fall on one learning ability type (e.g. only information or only attitudes or only skills), but should focus on a combination of all types, aiming at an overall development of the learners as well as a maximization of the effectiveness and the quality of learning. In relation to this, it may be argued on the basis of Kolb's model of the learning cycle that in a cyclical learning process the first element is the reception of the information and the experience. The second element is the processing of the experience. Thus, some might reflect on the experience while others will be more active and will transform the information so that it conforms to their mode of thinking. This outcome is in agreement with the findings of a relevant research study (Claxton and Murell, 1987), according to which the more ways used in learning, the richer the learning.

With respect to the contribution of learning styles as a significant diagnostic factor in the definition and treatment of various learning needs and other learning difficulties (Tennant, 1988), it may be argued that it is linked to the exploitation of the Learning Style Inventory of the four learning styles created by Kolb and it concerns the learners' orientation towards learning. The specific questionnaire consists of twelve questions and it describes the way each individual learns and how s/he manages ideas and real situations that relate to each one of the four learning ability types (Kolb, 1993). Within this framework, learning styles can also be used as a factor for comprehending career orientation and counselling (Tennant, 1998).

With regard to the exploitation of learning ability types as a method of self-evaluation, it seems that self-evaluation may be used as a diagnostic tool incorporated in the practice of the learning process, so as to detect learners' weaknesses and strengths while at the same time opportunities for adaptations and improvements are found (Conti, 1993). Furthermore, it may be used as a framework that can reinforce the educator's attempt to cover teaching material in ways that suit better the diversity of the class. This outcome, which confirms our fourth and fifth research hypotheses, in combination with the fact that self-evaluation is included, according to the literature (Cohen and Levinthal, 1990, Zink et al., 1994, Conti, 1993, Huber, 1991, Argyris and Schon, 1978), in the modern approaches to the improvement of the quality of education, means that self-evaluation "arms" the educator and the educated with a useful tool, contributing to the enhancement of effectiveness and of quality of learning. At the same time, it may assist in the long run learners and teachers, as well as the class as a whole, "to learn how to learn". This is due to the fact that it increases their ability to learn collectively and to become more efficient as a result of the increased effectiveness of "a collective intelligence".

Another important finding is that which concerns the goal of promoting equal opportunities in accessing education for all students since learning styles can be incorporated and used in a framework of planning, organizing, executing and evaluating teaching while at the same time they can help the average student as well as the excellent student and, finally, the student who needs support, since they can strengthen everyone's abilities to learn in favourite or less favourite ways. This finding, which confirms our sixth research hypothesis, means that learning is considered to be a universal right for learners from all socio-cultural backgrounds and a wide spectrum of abilities and needs. This view of learning associated with the role and the ability of education to promote, to preserve and to reinforce social justice and equality as well as to create those conditions that will contribute to the improvement and the progress of all people. Above all, however, it concerns the role education plays in the shaping of learners into individuals that are ethically free, autonomous and creative in society.

With respect to the exploitation of learning ability types in the sector of in-service education and training for employees in companies, it may be argued that it is related to the need to focus on organizational learning. The creation of organizational learning that concerns the ability of a company as a whole to create new knowledge, to communicate it to the entire organization and to incorporate it in its products, services and systems seems to constitute a significant factor of success for companies, especially with regard to the creation of a competitive advantage given the continuous changes in the business world (Nonaka and Takeuchi, 2003). This is due to the fact that, as the renowned academic Peter Drucker (1994) claims, the performance of an individual, of a company, of an industrial sector, or of a country in the acquisition and application of knowledge will become the most important competitive factor. Therefore, companies little by little realize that their most important capital is their intellectual capital, the knowledge of their members and their ability to develop it and put it into practice. Given that learning is one of the most important forms of interaction in the creation of organizational learning, its successful management becomes of primary importance for companies and the exploitation of employees' learning styles seems to be a major contribution towards this goal.

9. Conclusion

From the above-mentioned and on the basis of the research hypotheses postulated by the present study, the following conclusions may be drawn so as to secure the quality of learning with the application of Kolb's model of learning abilities.

- When talking about the quality of learning we mean a synthesis of thinking types, metacognitive approaches and values which refer to the acquisition of

notional elements of informational, organizational, analytical and practical knowledge and the acquisition of skills that allow, on the one hand, the transformation of informational data and, on the other hand, a continual self-improvement; these, in turn, allow autonomous and self-regulated learning to take place and a systematic guidance of cognitive processing for the solving of difficult and complex problems.

- The improvement of the quality of learning for all students plays a significant role in the current setting of economic, social and human development as well as progress, and functions, primarily on a human-centred basis, but also as a demand and result of the globalised economy.
- Learning styles can constitute a crucial factor of success in a learning environment that intends to support student success through the exploitation of their abilities and talents.
- Any attempt at improving the quality of learning should focus on the student and should investigate the following two issues: (a) the degree to which an educational institute responds to the individual needs and abilities of its students through an ongoing search of ways to define learners' needs and their differing learning styles; (b) the degree to which an educational institute takes advantage of learning styles within a comprehensive framework of teacher planning, conducting and evaluating of the learning activities.

In conclusion, promoting quality of learning for all students must constitute the dominant strategic policy for every modern educational organization because Edmonds' (1979) quotation: "everyone can learn" is not only true but all the more timely today than it ever was. What we need to do is to show "how". This constitutes a duty, as Freire (2006) put it, "to continuously define the way we understand the world around us" and to continuously search for ways to turn this understanding into practice, to support it and to take advantage of it so as to better our world. And there are many ways to achieve this. In the case of education, learning styles offer a good alternative choice towards this goal.

References

Adams D. and Hanm M., 1994, "New Designs for Teaching and Learning". Jossey-Bass, San Francisco, p. 17.

Allinson C. and Hayes J. 1988, "The learning styles questionnaire: An alternative to Kolb's inventory", J. Manage. Stud., vol. 25, pp.269-281, doi: 0022-2380.

Argyris C. and Schon D.A, 1978, "Organization Learning: A Theory of Action Perspective". Reading, Addison – Wesley.

Aspin DN, and Chapman JD, 1997, "Autonomy and Mutuality, Quality education and Self-Managing Schools". In: Restructuring and Quality: Issues for Tomorrows School, Townsend, T. (Ed.). Routledge, ISBN: 0-415-13339-4, pp.61-77.

Bandura A., 1991, "Human agency: The rheotoric and the reality", Am. Psychol., vol. 2, pp.157-162.
Bloom B., 1956, "Taxonomy of educational objectives. Handbook I: Cognitive Domain, Longman,, New York.
Claxton C. and Murrell P., 1987, "Learning styles: Implications for improving education practices". ASHE-ERIC Higher Education Report 4. Association for the Study of Higher Education, DC: Washington.
Cohen W. and D. Levinthal, 1990, "Absorptive Capacity: A New Perspective on Learning and Innovation", Administrative Science Quarterly, vol. 35.
Conti T., 1993, "Building Total Quality Management, A Guide for Management". Chapman and Hall.
Darra M., 2002, "Improving Quality: A New Challenge and Prospect for 21st Century Education". In: Education Facing the Challenges of the 21st Century-New Directions and Prospects, Matthaiou, D. (Ed.). Livanis, ISBN: 960-14-0493-72002, p. 275-285.
Dornyei Z. 2005, "The Psychology of the Language Learner." Laurence Erlbaum Associates, Mahwah, p.124, N.J.
Doukas C. 1999, "Quality and Evaluation in Education. Concise Research Review. Educational Issues Review, Pedagogical Institute, Athens.
Drucker P., 1994, Knowledge Work and Knowledge Society, The Social Transformation of this Century. The 1994 Edwin L. Goodkim Lecture.
Edmonds R., 1979, "Effective schools for the urban poor". Educ. Leadership, vol. 37, pp. 15-24.
Ennis R.H., 1987, "A Taxonomy of Critical Thinking". In: Teaching Thinking Skills, J. Baron and R. Sternberg (Eds.). Freeman, New York.
FEFC, 1996 "Achievements of colleges on their charter Commitments". FEFC. London.
FEFC, 1994 "Measuring Achievement." FEFC. London.
Freire P., 2006, "Ten Letters to Those Who Dare to Teach" Epikentro, p.176.
Gagné R., 1967, "Instruction and the Conditions of Learning". In: Contemporary Theories of Instruction, L. Siegel (Ed.). Chandler, San Francisco.
Gagné R., 1968, "Learning hierarchies", Educ. Psychol., vol. 6, pp.1-9.
Gagne R., 1985 "The Conditions of Learning and Theory of Instruction". 4th edition, Holt and Winston, p.3.
Glatthorn, A. and Baron, J., 1991, "The Good Thinker". In: Developing Minds, A.C. Costa (Ed.). ASCD. Alexandria, p. 65.
Halpern D., 1999, "Esperanto and the tower of Babel: A Taxonomy of Thinking". In: Teaching Thinking, E. Matsagouras and A. Eyklidem (Eds.). Special Issue of Psychology, vol. 6, no 3.
Halpern D., 1993, "Thought and Knowledge." 2nd edition Erlbaum, Hillsdale, NJ, 1996 D. Kolb, Learning Style Inventory. Meir, p. 24.
Harvey L. and Green D., 1993, "Defining quality", Assess. Eval. Higher Educ., vol. 18, 1993, p. 9-34.
Herron J., 1992 "Feelings and Personhood: Psychology in another Key," Sage, London.
Hittman J.A, 1993, "TQM and CQI in post-secondary education", Qual. Prog., vol. 26.
Huber G., 1991, "Organizational Learning: The Contributing Processes and the Literatures, Organization Science, vol. 2, no 1.

Jansen, 1995, "Effective schools", Compared. Educ., vol. 31.
Kazamias A., 1960, "What Knowledge is of Most Worth?", An Historical conception and a Modern Sequel, Harvard Education Review, vol. 30, no 4, pp. 307-330.
Kelly C., 1997, "David Kolb, the theory of experiential learning and ESL", The Internet TESL Journal, vol. 3, no 9, p. 4.
Kolb DA, 1976, "Learning Style Inventory: Technical Manual." Mc Ber.
Kolb DA., 1984, "Experiential Learning." Prentice Hall, Englewood Cliffs, p. 38, N.J.
Massialas V., 1986, "School as a Life Workshop." Grigoris, Athens.
Matsagouras E., 2006, "Teaching Strategies. Critical Thinking in Teaching Practice, Theory and Practice of Teaching". Gutenberg, ISBN: 960-01-0659-2, P. 100-105.
Matthaiou D., 2000, "Introduction to the Evaluation of the Quality of the Educational Product: Fundamental Concepts and Admissions". In: Handbook for the Evaluation and Planning of the Educational Product in Primary and Secondary Education Schools. D. Matthaiou, (Ed.). Pedagogical Institute.
McGill M., Slocum J. and D. Lei, 1992, "Management Practices in Learning Organizations", Org. Dyn., vol. 42.
Miller J. and lnniss S., 1992, "Strategic Quality Management." Consultants at Work, Ware Herts.
Mouti A., 2008, "Measurement of learning styles in the evaluation of foreign language teaching", Educ. Iss. Rev., vol. 14, pp. 35-50.
Muller D. and Funnell P. 1992, "Exploring learners, perceptions of quality. Proceeding of the AETT Conference on Quality in Education", University of New York, pp: 6-8.
National Accreditation Council for Certification Bodies, 1993, (NACCB), "Guidelines on the application of IS0 9001 to further education and training". NACCB.
Nonaka I. and Takenchi H., 2003, "The Knowledge – creating company." Kastaniotis, ISBN 978-960-03-3560-6, P. 31.
Owlia M.S., and Aspinwall E.M., 1997. "TQM in higher education a review", Int. J. Qual. Reliab. Manage. vol. 14.
Oxford R., Hollaway M.E. and D. Hoeron-Murillo, 1992, "Language learning styles: Research and practical consideration for teaching in the multicultural tertiary ESL/EFL classroom", System, vol. 20, pp. 439-459.
Pace F.S, 1991, "Government Processes for Including Thinking Skills in the Curriculum". In: Enhancing Learning and Thinking. R. Mulcahy, et al. (Ed.). Praeger, p. 27.
Presseisen B., 1991, "Thinking Skills". In: Developing Minds. A. Costa, (Ed.), ASCD. Alexandria, VA.
Quellmalz E., 1991, "Needed: Better Methods of Testing Higher-Order Thinking Skills". In: Developing Minds. A. Costa (Ed.), ASCD. Alexandria, VA.
Riding R., Glass A. and G. Douglas, 1993, "Individual differences in thinking: Cognitive and neurophy sociological perspectives", Think. Educ. Psychol., vol. 3, pp. 267-279.
Robertson I.T., 1985, "Human information-processing strategies and style", Behave Inform. Technol., vol. 4, pp. 19-39.
Rogers A., 1999, "Adult Education". Metaihmio, Athens.
Rogers C.R. and Freiberg H.J., 1994, "Freedom to Learn". Merrill-Macmillan, p. 108, OH.
Sallis E. and Hingley P. et al., 1992, "Total quality management", Staff College, vol. 23, p. 1.

Sallis E., 1994, "A Framework for quality management." Bristol, the staff college. Mendip Paper 070.

Schwab J., 1970, "The Practical: A Language for Curriculum." National Education Association Center for the Study of Instruction, Washington.

Seymour D., 1992, On Q: Causing Quality in Higher Education. Macmillan, New York.

Simons L. and Duffy, 2000, "New learning. Three Ways to Learn in a New Balance". In: New Learning. R.J. Simons et al. (Ed.), Kluwer Academic Publishers.

Spanaka A.K., 2007, "Learning styles as a fundamental design factor for ODL educational material". Open Educ., vol. 5, pp. 100-111, doi: 1790-3254.

Sternberg R., 1987, "Questions and Answers about the Nature and Teaching of Thinking Skills". In: Teaching Thinking Skills. J. Baron and R. Sternberg (Eds.), Freeman, New York.

Tennant M., 1988, "Psychology and Adult Learning." Routledge, p. 89.

Terrell S., 2005, "Supporting different learning styles in an online learning environment: Does it really matter in the long run?" J. Distance Learn. Admin., vol. 8, no 2.

Vroeijenstijn A., 1995, "Government and university: Opponents or allies in quality assurance", Higher Educ., vol. 28, pp. 355-371.

West – Burham J., 1997, "Managin Quality in Schools, effective strategies for Quality School Improvement". Financial Times, Prentice Hall.

Young M., 1971, "Knowledge and Control". MacMillan, London.

Zink KJ et al., 1994, "Quality Assessment: Instruments for the Analysis of Quality Concepts based on EN 29000, the Malcolm Baldrige Award and the European Quality Award", Total Quality Management, vol. 5, no 5.